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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/538,953  
Filing Date: March 13, 2006  
Appellant(s): SEIDEL, FRANK

\_\_\_\_\_  
Robert L. Grabarek, Jr.  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 4/8/2010 appealing from the Office action mailed 1/8/2010.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

5,462,013	PUNOLA ET AL	10-1995
4,156,042	HAYMAN ET AL	5-1979
GB 1070396	JENKIN	6-1967

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 18-22 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Punola et al ('013).

Punola teaches a method for CVD coating of workpieces (gas turbine engine blades), in particular for aluminizing, comprising: arranging the workpieces **45** to be coated in a coating room, arranging coating granules (Al-Cr particulates) near the workpieces in receptacles **B1**, **B2**, heating the coating room with heater **12** to a process temperature together with the workpieces and together with the coating granules, introducing a process gas ( $\text{AlCl}_3$ /carrier) onto the coating granules after reaching the process temperature to generate the coating gas ( $\text{AlCl}$ ,  $\text{AlCl}_2$ ), and forming a coating on the workpiece with the coating gas. The workpieces **45** are positioned in several levels arranged one above the other in the coating room and wherein coating granules are arranged in receptacle **B2** directly beneath the workpieces in each level. The process gas is introduced to each level (Fig. 2, Col. 14, line 23, Col. 1, line 57, Col. 6, lines 1-25). The process parameters are kept constant while workpiece is being coated since

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Punola discloses a specific deposition temperature and that a vacuum pump maintains streams **S1**, **S2** at desired flow rates (Col. 5, lines 9-15).

Thus, Punola discloses every limitation of claims 18-22 and 24 and anticipates the claims.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 23, 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Punola et al ('013) as applied above in view of Hayman et al ('042) and Jenkin (GB 1070396).

Punola does not teach pulsing a process pressure during the holding time by lowering the process pressure by withdrawing the coating gas and then generating a second coating gas.

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Hayman discloses a process for producing diffusion coatings on turbine blades comprising enclosing the turbine blade in a chamber with a particulate (Al, Cr, etc) and halide activator and cyclically varying the pressure of an inert or reducing gas or mixture of said gases within the chamber while maintaining the contents of the chamber at a sufficient temperature to form a diffusion coating (Abstract, Col. 2, lines 15-34). The pressure is varied by lowering the process pressure by exhausting the chamber and repeating the cycle by then introducing the inert or reducing gas to the chamber to restore the pressure (Ex. 1). The turbine may be suspended over a tray containing the particulate (Col. 4, lines 43-45). This method is particularly applicable to coating interior spaces in turbine components.

Jenkin discloses that a uniform coating may be deposited on interior surfaces (bores, holes, cavities, etc.) and external surfaces of a substrate simultaneously by subjecting the coating gas to pulsating pressure conditions in which the gas pressure is alternately and repetitively reduced and increased (p. 1, lines 55-80).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to pulse the process pressure in the process of Punola by withdrawing the coating gas (exhausting chamber) to lower the pressure and then introducing the reducing gas to increase the pressure as suggested by Hayman in order to deposit uniform coatings on interior surfaces of the turbine components as well as exterior surfaces as suggested by Jenkin.

Regarding Claim 23, Hayman discloses generating a vacuum by pumping out the chamber before introducing the process gas into the coating room (Ex. 1) and Punola is

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capable of such since it discloses a coating room having a vacuum pump attached thereto (Col. 3, lines 9-15).

Regarding Claim 25, by introducing the reducing gas (process gas) of Punola into the chamber to increase the pressure during the pulsing cycles a second coating gas would be generated due to the reducing gas passing over the granules (Al-Cr particulate).

Thus, claims 23 and 25-27 would have been obvious within the meaning of 35 USC 103 over the combined teachings of Punola, Hayman, and Jenkin.

#### **(10) Response to Argument**

##### **A.**

1.) Applicant argues that Punola does not disclose arranging "coating granules" which generate "coating gas" near the workpieces to be coated. Applicant argues that Punola discloses aluminum pellets arranged in gas generators 20, 22 that are separate from the chamber 10 to generate aluminide coating gas. The Examiner agrees that Punola generates an aluminide gas from the gas generators 20, 22 using aluminum pellets. However, Punola still discloses the limitations of claim 18. Punola discloses that the process gas (i.e.  $\text{AlCl}_3$ /carrier) is introduced onto coating granules (Al-Cr particulates) to generate a coating gas (i.e.  $\text{AlCl}_2$ ,  $\text{AlCl}$ ) (Col. 6, lines 1-25). The limitations "process gas" and "coating gas" are not defined within the instant specification and giving the limitations the broadest reasonable interpretation, the gas generated after passing the  $\text{AlCl}_3$ /carrier gas mixture over the Al-Cr particulates would be a "coating gas" since it is this gas (i.e.  $\text{AlCl}_2$ ,  $\text{AlCl}$ ) that is used to coat the workpiece

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(See Punola, Col. 6, lines 20-25). Further, the dictionary defines "generate" as "to originate by a vital, chemical, or physical process" (Merriam-Webster, see attached entry). Punola discloses that the coating gas (i.e.  $\text{AlCl}_2$ ,  $\text{AlCl}$ ) is originated by a chemical process (i.e. reducing  $\text{AlCl}_3$ ) and thus meets the limitation of "to generate the coating gas."

Applicant argues that the Examiner's argument disregards that Punola's "coating granules" are the explicitly disclosed aluminum pellets in the gas generators 20, 22 and that the "reactivity-altering material" (i.e. Al-Cr particulates) does not "generate" the "coating gas", but only alters the reactivity of the already generated reactive coating gas. The Examiner disagrees. Claim 18 of the instant invention discloses that the coating gas is used to coat the workpieces. Thus, the "coating gas" in Punola is the aluminum subchloride gas ( $\text{AlCl}_2$ ,  $\text{AlCl}$ ) that is generated by introducing the process gas ( $\text{AlCl}_3$ /carrier) to the coating granules (Al-Cr particulates) since it is being used to coat the workpieces (Punola, Col. 6, lines 20-25). Further, Claim 22 defines the process gas, being introduced over the coating granules to generate the coating gas, as a halide gas. Punola discloses that the "process gas" being introduced over the "coating granules" (i.e. Al-Cr particulates) to generate "coating gas" (i.e.  $\text{AlCl}_2$ ,  $\text{AlCl}$ ) is a halide gas, such as aluminum trichloride (i.e. aluminum halide). Although Punola discloses gas generators 20, 22 having aluminum pellets located outside the chamber, Punola still discloses the limitations of claim 18 as discussed above.

**2.)** Applicant argues that the reactivity-altering material (i.e. Al-Cr particulates) of Punola cannot be interpreted as "coating granules" for the further reason that



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“process gas” is not introduced onto this reactivity-altering material to generate coating gas. The Examiner disagrees. As discussed above, Punola discloses generating coating gas ( $\text{AlCl}_2$ ,  $\text{AlCl}$ ) by introducing process gas (i.e.  $\text{AlCl}_3$ /carrier) onto the coating granules (i.e. Al-Cr particulates) (Col. 6, lines 20-25). Claim 22 further defines the process gas as a halide gas. Punola discloses that the “process gas” being introduced over the “coating granules” (i.e. Al-Cr particulates) to generate “coating gas” (i.e.  $\text{AlCl}_2$ ,  $\text{AlCl}$ ) is a halide gas, such as aluminum trichloride (i.e. aluminum halide). Thus, the reactivity-altering material (Al-Cr particulates) may be considered “coating granules” as defined by the present invention.

**3.)** Applicant argues that Punola explicitly discloses that the coating gas is formed by flowing an acid halide/carrier process gas over the aluminum pellets in the gas generators 20, 22 to form aluminide coating gas and that even a broadest reasonable interpretation of claim terms cannot change such explicit disclosure. The Examiner disagrees. Punola does not use the same terms as the present invention, such as “process gas”, “coating granules”, and “coating gas”. Since the aluminide gas ( $\text{AlCl}_3$ /carrier) generated in the gas generators 20, 22 is passed over Al-Cr granules to form a  $\text{AlCl}_2$  or  $\text{AlCl}$  gas prior to coating the workpieces (Col. 4, line 62-Col. 5, line 2, Col. 6, lines 1-25), the aluminide gas ( $\text{AlCl}_3$ /carrier) may reasonably be interpreted as “process gas” and the aluminum subchloride gas ( $\text{AlCl}_2$ ,  $\text{AlCl}$ ) may reasonably be interpreted as the “coating gas” since it is the aluminum subchloride gas that is actually coating the workpiece. The explicit disclosure of how the “process gas” ( $\text{AlCl}_3$ /carrier) is

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generated is not being changed by giving the claim terms their broadest reasonable interpretation.

**B.** Dependent claims 23 and 25-27 stand or fall with independent claim 18. Claim 18 has been addressed above.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Elizabeth Burkhart/  
Examiner, Art Unit 1715

Conferees:

/Timothy H Meeks/

Supervisory Patent Examiner, Art Unit 1715

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